THURSDAY, JULY 19, 1917.

ACROMEGALY AND THE EXTINCTION OF SPECIES.

Théorie de la Contre-évolution, ou Dégénérescence par l'Hérédité pathologique. Par le Dr. René Larger. Pp. xiv+405. (Paris: Félix Alcan, 1917.) Price 7 francs.

IN 1885, when Dr. Pierre Marie, who has just succeeded the late Prof. Déjerine in the chair of clinical neurology in the University of Paris, was the youthful director of the laboratory attached to La Salpêtrière, he was impressed by the similarity of the condition and symptoms presented by two women who had entered the great nerve hospital as patients. In both women a disastrous change had been wrought in their physical appearance and well-being; in the course of a year or two their faces had become big and ugly, so that even their relatives and friends failed to recognise them; their hands and feet grew in size and changed in shape, although the normal period for growth wâs long past. Dr. Marie perceived that the morbid state presented by these two women was identical, and that it was a diseased condition which, up to that time, had passed unrecognised. He published an account of his two patients,[1] giving the name "acromegaly" to the condition, because of the enlargement of the extreme parts of the body—the hands, feet, and face.

The original description was no sooner published than cases began to be reported by clinicians from every part of the world. Hundreds of cases are now on record. Very soon it was recognised that nearly all giants, besides suffering from a generalised overgrowth, were also the subjects of this peculiar, or acromegalic, kind of growth. As a result of thirty-two years of observation and experiment it may be regarded as now certain that gigantism, acromegaly, and a number of other conditions are directly related to a disordered state of the pituitary gland—an organ so minute that it forms only $\frac{1}{150000}$ part of an adult human body.

In his theory of "contre-évolution" Dr. René Larger has developed the idea that gigantism and acromegaly may attack not an individual here and there as amongst mankind, but may break out in a whole species or genus, so that all the individuals become affected, at first with a moderate degree of acromegaly, but finally with an unrestrained pitch of gigantism, in which condition the whole race or family finally perishes. He is of opinion that his theory explains many facts which now seem obscure to those who are studying living and extinct forms of animal life. He selects his examples from the great dinosaurians, the living and extinct great birds, and whales, elephants, and anthropoids, as mammalian representatives.

Although we are willing to admit that Dr. Larger is the first to apply in a systematic manner certain medical concepts to problems concerning the evolution and extinction of animal forms, and that he has rendered a service to biologists in doing so, we do not think that either his confrères in France or his colleagues abroad will agree that he has done justice to the present state of our knowledge regarding the growth of the human body. Dr. Larger regards the enlarged or disordered state of the pituitary gland, which is invariably found in the subjects of gigantism and of acromegaly, as merely one of many manifestations of the disease, whereas the prevailing and best-founded opinion is that a direct and causal connection exists between the disorder of the pituitary gland and the disturbance of growth. The pituitary is, however, only one element in a series of growth-controlling glands. In the mechanism of growth and of adaptation of the body to its surroundings the genital glands, the adrenal gland, the thyroid, the pancreatic, and the pituitary glands, and many minor bodies, take a part; between them they determine the shape given to the body, and the form given apparently depends on the dominance of one or more of the members of this growth-controlling endocrine mechanism.

When in his Croonian lectures of 1905 Prof. Starling gave the name of "hormones" to the "chemical messengers" sent out by one organ of the body to control the action or growth of any other organ or part of the body, he and Prof. Bayliss had a very clear appreciation of the important part hormones were to play in all biological investigation and speculation. They realised that they were dealing with the most primitive mechanism for co-ordinating the functions and systems of a composite animal body—one which must have ante-dated the appearance of a nerve-system, and could serve to link the tissues of the body to the germ plasm of the unborn seed. We cannot say that zoologists have shown any undue haste in applying and testing the theory of hormones.

In 1908 Mr. J. T. Cunningham (Proc. Zool. Soc., p. 434) applied the theory of hormones to explain inheritance; in his presidential address to the Section of Zoology of the British Association at Sheffield in 1910 Prof. C. C. Bourne clearly recognised the *rôle* of hormones in the evolution of new forms; in recent writings by Prof. A. Dendy and by Prof. E. W. MacBride it can be seen that they, too, have grasped the importance of hormones to zoologists. It is this wider concept of hormones that we should prefer to see applied to the problems which Dr. Larger has dealt with in his theory of "contre-évolution," but, even if we cannot get the whole loaf, we must be thankful to him for a piece of real bread.

A. KEITH.

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[1] *Revue de Médecine* (1886), vol. vi., p. 297.

ELECTROTECHNICAL BOOKS.

(1) *The Range of Electric Searchlight Projectors.* By Jean Rey. Translated by J. H. Johnson. Pp. xiv+152. (London: Constable and Co., Ltd., 1917.) Price 12*s.* 6*d.* net.

(2) *The Calculation and Measurement of Inductance and Capacity.* By W. H. Nottage. Pp. 137. (London: The Wireless Press, Ltd.) Price 2*s.* 6*d.*

(3) *Electric and Magnetic Measurements.* By

Charles Marquis Smith. Pp. xii+373. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1917.) Price 10*s.* 6*d.* net.

(4) *A Laboratory Course of Practical Electricity for Vocational Schools and Shop Classes.* By M. J. Archbold. Pp. ix+211+exp. 98. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1916.) Price 5*s.* net.

(5) *Electrical Measurements and Testing: Direct- and Alternating-Current.* By Chester L. Dawes. Unpaged. (New York: John Wiley and Sons, Inc.) Price 3*s.* net.

(6) *Electrical Laboratory Course for Junior Students.* By Prof. Magnus Maclean. Pp. 120. (London: Blackie and Son, Ltd., 1916.) Price 2*s.* net.

(1) SINCE the outbreak of the war there has been an urgent demand by our air, naval, and military forces for information relating to the range of searchlight projectors. We therefore welcome this translation of M. Jean Rey's work. It is an open secret that during the course of the war very great improvements have been made in the manufacture of the carbons for projector lamps, and that they give a flux of light for a given power consumption from three to five times as great as that obtained from the old carbons.

The first electric searchlight was made by Louis Sautter in 1867. In the early lamps the carbons were arranged so that their axes were inclined at an angle. The efficiency was high, but the regulation of the carbons was a difficult and delicate operation. They are now always arranged with the carbons horizontal. In the first chapter the author gives an account of the experiments he carried out in the laboratory of the Sautter-Harlé works in 1902. He proved that for small arcs taking from 10 to 50 amperes the efficiency—that is, the ratio of the luminous flux to the electric power—increases with the current, but above 50 amperes the efficiency diminishes as the current increases. For instance, with a current of 250 amperes the efficiency is 13 per cent. less than with a current of 50 amperes. He also proved experimentally that the diameter of the crater was proportional to the square root of the product of the diameter of the positive carbon and the current. In chap. ii. formulæ are given for the illumination obtained with a specified reflector. From these it appears that, neglecting absorption, the illumination at a given distance is proportional to the square of the focal length of the reflector, and is inversely proportional to the square of the diameter of the crater. The efficiency of electric searchlights is next considered, the losses due to the front glass, the shadow losses due to the lamp, and the losses due to the flashing shutters being taken into account.

Blondel's law for the range of a searchlight is fully explained, and values are given for the coefficient of atmospheric transparency. When the humidity of the air is great the coefficient is perceptibly reduced, and when the air contains particles of dust the coefficient is very appreciably diminished. In the last chapter the difficult problem of the influence of visual acuity on the range is discussed, and references are given to Blondel's work.

Numerous interesting phenomena are mentioned. For example, when convoys, pioneers making trenches, aviators, etc., are caught by the beam of a searchlight at a great distance they generally imagine that they must be visible to the enemy and so take cover. It is pointed out that in many cases the enemy would be quite unable to see them. The work will prove of great value to engineer officers. We have noticed one or two misprints in some of the mathematical equations, but the corrections are obvious.

(2) A knowledge of easy methods of measuring and of rapid methods of calculating with high accuracy the inductance of currents and the capacity of conductors is of great value in radiotelegraphy. On these subjects, therefore, a great deal of experimental ingenuity and mathematical labour have recently been expended. Mr. Nottage begins by giving formulæ for inductance and capacity, and he illustrates their use by numerous numerical examples. He then describes experimental methods of measuring these quantities, and finally gives brief descriptions of the appliances now used in making these measurements. Extensive use has been made of papers which have recently been read to the London Physical Society and to the Institution of Electrical Engineers.

As the author is writing for the benefit of physicists and engineers, the mathematical proofs of the formulæ, which are as a rule long and tedious, have been omitted. The publication of a formula without proof, however, has its drawbacks. The user of a formula obtained in this way is at the mercy of misprints. As the limitations of the formulæ also are not given in all cases, he may easily fall into error. In chap. ii., formula (11), p. 41, we notice that in the formula for the joint capacity of two spheres ·3863 has been printed instead of 1·3863. The limitations of the formula for the inductance of a rectangle are not stated. Rayleigh's formula for the inductance of a concentric main, which is perhaps the most important of them all, has been left out altogether.

On p. 47 a formula (18) is given for the average potential of a single straight wire. We are quite unable to make sense of the formula. It is stated to be only approximate, but then the "accurate expression" (19) is also given; and finally, we are told that for all practical purposes the difference between the two formulæ is negligible. Doubtless also to the same degree of accuracy the approximate formula for the capacity of a wire deduced from that of a prolate spheroid by making the equatorial axis very long will agree with either. Unfortunately, the exact solution is not known. We therefore have to pass over the next fourteen pages, as we cannot understand them. Heaviside has shown how to calculate the capacity and inductance of horizontal antennæ

("Electrical Papers," vol. i., p. 42 and p. 101, or Russell, "Alternating Currents," vol. i., p. 199).

The collection of methods of measuring inductance and capacity given in chaps. iii. and iv. will be found useful. The discussion in chap. vi. of Duddell, Campbell, and Drysdale vibration galvanometers is good so far as it goes, but the reader would be grateful for more information. The author seems to have written the book rather hurriedly. The wireless electrician and the physicist, however, will find it useful.

(3) Prof. Smith's book consists partly of lectures and partly of laboratory exercises on electric and magnetic measurements. The arrangement of the subject is good, and the lengthy definitions and explanations of units will be helpful to students. The definitions of self and mutual inductance are very properly given in terms of the linkages of flux and current, but the author has not made it quite clear what a linkage is. In order to explain what is meant by a linkage, it is necessary to show how the linkages of the magnetic flux inside the wire itself with fractional parts of the current can be calculated. As an elementary knowledge of the calculus is presupposed, this can easily be done.

The definitions of electrostatic capacity are not quite happy. No clear distinction is made between the capacity of a conductor and the capacity between two conductors. For example, the author says that a condenser is "a device by means of which the capacity of an isolated conductor can be very greatly increased" by the presence near it of another charged conductor. Unless, however, the conductors have equal and opposite charges, the equations given later do not apply. The book is clearly printed and the methods are up to date.

(4) These leaflets form a laboratory course for boys and apprentices in vocational schools and shop classes. Gaps are left in the printing of the leaflet where the boy has to write down what he has observed, and spaces are provided for a sketch of the apparatus used and for a graph of his results. Rough sketches are given in the appendix of the apparatus used, and these will be a great help to beginners. Numerous easy examples are given. The leaflets are excellently adapted for the class of student for whom they have been written. The Brown and Sharp Wire Table and the "circular mil" are much in evidence. The "circular mil" is a quaint unit, being the area of a circle 1 mil (0·001 of an inch) in diameter. We hope that it will soon become obsolete.

(5) Mr. Chester Dawes is instructor in electrical engineering at Harvard University. This "loose-leaf" laboratory manual is intended to be used in conjunction with Timbie's "Electrical Measurements" and Karapetoff's "Elementary Electrical Testing." The leaflets are thoroughly practical, and the arrangement of the experiments is excellent. After doing, for instance, the experiment on "conduit-wiring," the student would have acquired excellent ideas about the best methods of installing electric-light wires in conduits. He would also know how to make joints in cables and how to test their insulation resistance. Given an elaborate electrical laboratory, this manual is admirably adapted to train students to become really useful electricians in the minimum possible time. Some of the questions asked on the leaflets will give them plenty of food for thought.

(6) This book gives a well-arranged series of experiments suitable for a junior course in an electrical engineering laboratory. They are all thoroughly utilitarian and will be a great help to the student when he goes to an electrical works or a power station. Prof. Maclean asks the student to obtain the "efficiency" of an arc lamp in watts per mean hemispherical candle-power. He very properly puts the word "efficiency" between quotation marks. The efficiency is really the mean hemispherical candle-power per watt, and it is high time that this definition were adopted by engineers. We are doubtful whether the use of Rousseau's diagram to measure the mean hemispherical candle-power of arc lamps is justified, considering how uncertain some of the measurements are owing to the continual fluctuation in the intensity and the colour of the light. One of the simpler methods of approximating to the mean hemispherical candle-power would be more suitable.

A. RUSSELL.

OUR BOOKSHELF.

Lessons in Pharmaceutical Latin and Prescription Writing and Interpretation. By Hugh C. Muldoon. Pp. vii + 173. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1916.) Price 6*s*. net.

FOR the past quarter of a century the Latin used by medical practitioners in writing their prescriptions has become more and more simple, and the use of the vernacular has correspondingly increased. Nevertheless, so many prescriptions are still written in that language that the pharmacist must be sufficiently well acquainted with it to interpret them correctly. The author assumes no knowledge of Latin on the part of the student and endeavours to teach him what is essential in the limited time at his disposal. To accomplish this, much of the conjugation of the verbs and of the declension of the nouns, and so on, has been omitted, and the student's attention concentrated on those parts which are of constant recurrence.

The work is divided into twenty-five chapters. From the commencement the exercises are based on such words and expressions as occur in prescriptions, passing from the simplest to the more complex. While it is not, and does not profess to be, a complete Latin grammar of pharmacy, it certainly embodies a rational method of teaching a student the Latin essential to his calling without burdening his memory with a host of conjugations and tenses with which he will never meet. The necessary rules are clearly and concisely stated. Though written for American students, it can equally well be used by British, and undoubtedly deserves to meet with success.